

Brush Management

Iowa Job Sheet

Natural Resources Conservation Service
Des Moines, Iowa

Iowa Conservation Practice 314
August 2016

Definition

Brush management is the removal, reduction, or manipulation of woody, non-herbaceous or succulent trees and shrubs, including those that are exotic, invasive and noxious. (Woody plant species often found to be undesirable include, but are not limited to: bush honeysuckle, Japanese honeysuckle, locusts, tree-of-heaven, autumn olive, multiflora rose, eastern red cedar, and several buckthorn species.)

Purpose

Brush management may be used to restore desired vegetative cover to protect soil from erosion, reduce sediment, improve water quality, and enhance wildlife habitat and species diversity. It may also be used to improve grazing conditions so grazing animals can easily access forage of better quantity and quality. Brush management can also be used to protect property from wildfires.

Treatment activities will encourage the control of woody plant species in non-cropland areas. Early detection and treatment are necessary to control the establishment and spread of undesirable woody plant species in non-cropland areas. If left unchecked, these plants can threaten plant diversity, pasture and forest productivity, forest regeneration, and wildlife habitat. This practice can be utilized for natural community restoration and wildlife habitat improvements.

Conditions Where Practice Applies

On native and naturalized pastures, hayland, and wildlife and other lands where trees and shrubs need to be removed to restore or create the natural or desired plant community.

General Specifications

Evaluate the trees and shrubs located in the treatment area and the woody vegetation to be removed to meet the target objectives.



Brush management can be accomplished by using one of the following alternatives. In many situations it may be preferable to use a combination of these alternatives. Soil disturbance shall be left to a minimum. Select the method(s) to be used.

- 1. Mechanical:** This can include tree shearing, using a dozer, use of mechanical devices, mowing, or hand cutting.
 - » Shearing is best accomplished when ground is frozen or dry.
 - » Maximum regrowth (suckering), if desirable, is achieved when cut during the dormant season (October – March).
- 2. Prescribed Burning:** Conduct burning according to an approved burn plan that meets the NRCS Prescribed Burn (338) conservation practice standard.
- 3. Chemical/Herbicides:** This includes foliar broadcast, spot, cut stem, basal or soil treatments. Due to cost and environmental considerations, herbicide treatment should be restricted to small manageable areas. Consult the local Iowa State University Extension office for herbicide recommendations and timing of application.

Always follow label directions.

- 4. Biological:** Goats are the species of choice for controlling brush in pastures and abandoned farmland. Goats may be used to reduce woody species such as oak, buckbrush, multiflora rose, locust, cedar and honeysuckle. There may be other biological agents available, such as the rose seed chalcid, a torymid wasp, that attacks the multiflora rose rosette. (See Brush Management Job Sheet Addendum “Brush Management with Goats”)

Management

Without continued management activities small shrubs and trees become large and overgrown. Maintenance activities need to be continued on a regular schedule to suppress the growth of woody vegetation.

Control can be difficult once a population becomes established. Multiple treatments may be necessary to achieve eradication and are often dependent on species and extent of infestation. Appropriate herbicide applications often provide the most effective long-term control. Other effective methods include mechanical (cutting or specialized machinery), manual (pulling by hand), biological, and prescribed burning. The best results are often achieved by using a combination of methods, such as (cutting + herbicide application) or (cutting + herbicide application + prescribed burning).

Specifications

Treatment of woody species is often described as a component of resource inventories, grazing plans, wildlife management plans, or forest management plans. In instances where inventories or plans do not exist or do not sufficiently describe the extent of infestation, utilize the “OPTIONAL WORKSHEET FOR DETERMINING % CANOPY COVER OF TARGET SPECIES” to determine the extent and level of treatment.

Operation and Maintenance

- » Scout infested areas annually to detect re-growth or re-introduction of undesirable species into the site.
- » Apply follow-up treatments to re-growth of targeted species within the treatment area.
- » Success of the practice shall be determined by

evaluating post-treatment re-growth of target species after sufficient time has passed.

- » Length of evaluation periods will depend on the woody species being monitored.

General Recommendations and Guidance

(Provide detailed, site-specific information as needed)

Disposal: If needed, plan how treated material will be disposed before beginning any treatment methods. With cutting applications, stems and branches without berries can be left on site with little to no chance for re-establishment. If berries are present destroy branches by burning. With pulling methods, ensure all roots are exposed and not in contact with the soil surface to prevent re-rooting. Other solutions include burning or removing the material for appropriate off-site disposal. If seed heads are present, bagging and removal for offsite disposal is an effective method.

If O&M includes prescribed burning, consider methods to reduce fuel loads such as piling debris for burning when there is snow cover on the ground or shortly after a rain event. For natural community restoration, do not use heavy equipment to push and pile the treated material.

Recommendations for disposal of treated material:

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Herbicides: If herbicides are used, follow label rates, directions, and manufacturer recommendations. Use the current version of Win-PST to determine Soil/Pesticide Interaction Hazard Ratings. Each Hazard

Rating category will have an associated minimum Mitigation Index Score Level that must be attained. Use the current Iowa Integrated Pest Management (IPM) conservation practice standard (Code 595) to determine if planned conservation practices provide an adequate level of mitigation. Use Appendix Table 2 in the Iowa Agronomy Technical Note 37: “Pest Management in the Conservation Planning Process” to select additional IPM techniques if planned conservation practices are not adequate. Be sure to apply herbicide when the target plant is most susceptible to the chemical and the chosen treatment method. When choosing herbicides, review leaching, runoff potential, setback requirements, persistence, and toxicity ratings of chemical formulations. Adhere to all application setbacks directed by chemical label for use in proximity to water bodies and other environmentally sensitive areas. Mention of trade names for plant control chemicals is not an endorsement for a particular product.

Biological Control: Sheep and/or goats can be used as an ecologically sound and economically viable alternative for biological brush control, especially if combined with other treatment methods. Site specific grazing plans will need to be developed that lists target species to control, owner's objectives, number and



type of grazing animal to be used as well as timing, duration and frequency of each grazing event. Refer to Iowa Job Sheet: Brush Management with Goats.

Attach a map or aerial photo that shows:

- » Unit Boundaries (Field or Stand)
- » Treatment Area (If Different than Unit)
- » Planned Treatment Year (If Applicable)
- » Location & Description of Sensitive Resources (If Applicable)
- » Location & Description of Setbacks (If Applicable)

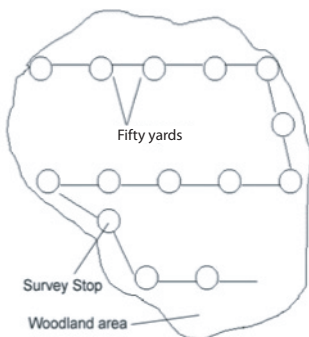
Description of each Unit (field or stand) that requires control

[illegible]

Landowner/Producer: _____ Field/Stand #: _____

Planner: _____ Date: _____

List Woody Target Species Observed in Plots:

[illegible]

1. Choose an end of the stand on which to start the survey. The starting point is also the first sampling point. (Recommend starting within the first 10 feet of the stand boundary)
2. At the first point, identify all invasive species present, group as either woody or herbaceous, and estimate each group's canopy cover to the nearest % within a 6' radius of sampling point. (Can be done sufficiently by extending a yard stick from an outstretched hand and turning 360 degrees)
3. Walk 50 yards (steps) in as straight a line as possible.
4. Once reaching a point where the next 50 yard walk will place the next plot outside the stand, turn right or left and walk parallel to the border for 100 yards, conducting 2 more survey stops.
5. Turn right or left again, heading in the opposite direction from the previous line.
6. Continue process until stand area has been walked and surveyed completely.

Goal & Objectives: _____

Schedule of Treatments

Unit Number	Average % Canopy Cover¹	Treatment (Year) (Number)		Target Specie(s) to be Controlled	Treatment Method(s) (Cutting, Chemical, Prescribed Burning, Pulling, etc.)²	Timing of Treatment(s) or Plant Growth Stage for Best Effective Control
<i>Example Unit 1</i>	<i>50%</i>	<i>2012</i>	<i>1</i>	<i>Bush Honeysuckle and Autumn Olive</i>	<i>Cut stump and chemical treatment during dormant season</i>	<i>Dec. 1 - Feb. 15</i>
<i>Example Unit 2</i>	<i>30% regrowth</i>	<i>2012</i>	<i>2</i>	<i>Same</i>	<i>Foliar chemical treatment on regrowth</i>	<i>Following leaf out for both species. Honeysuckle is effectively treated with foliar spray after other plants have gone dormant (Oct. or Nov.)</i>

1. Average % Canopy Cover (for the Unit) of target specie(s) will be used to determine level of the infestation within the treatment unit boundary. Estimate the average % cover over the entire treatment unit. The Optional Worksheet for determining % Canopy Cover of Target Species may be used for an inventory procedure. Treatment will be needed over the entire area of infestation regardless of percent cover of the target species in different areas of the unit.
2. Include specific application method(s), equipment type, herbicide type and rate, and timing of application(s). Provide reference documentation if methods, herbicide rate, and timing are provided through an alternative fact sheet, management plan, information sheet, study result, or other credible alternate source which is specific for control of the target species.

Additional Specifications and Post-Treatment Goals:

I certify that the above information meets NRCS specifications and design and installation.

NRCS Signature

Date

I certify that this practice has been installed according to NRCS Standards and Specifications.

Producer

Date

Brush Management with Goats



Criteria for Brush Management with Goats

Beginning threshold:

Canopy of brush species exceeds 25% measured at or below five feet averaged throughout the targeted area to begin.

Ending threshold:

All brush species have at least 80% leaf removal and some twigs possibly eaten below five feet in height throughout the treatment area at the end of July. Research has shown that defoliation after July has little effect so plan to have initial defoliation complete before August.

Method/Implementation

The total area to be browsed should be fenced into at least 5 paddocks, if at all possible. Initiate browsing as soon as the brush is fully leafed and defoliate as described above. Move goats to the next paddock and repeat. When the initial paddock leafs out again, regardless of where the goats are in the rotation, bring them back to the initial paddock to defoliate the brush again. Continue this method to manage brush until all paddocks have brush suppressed or killed to at least the threshold described above. Killing brush may take 2 to 3 years of repeated browsing.

Guard Animals or Protection

Most goat herds need protection from predators. A high voltage fence and a guard animal are a good idea.

Stocking Rates

The following table should be used for stocking rates with goats for weed and brush control:

Pasture Type	% Brush Canopy	Cows	Goats	Cows + Goats
Excellent Pasture	<10%		Not eligible for NRCS financial assistance	Not eligible for NRCS financial assistance
Brushy Pasture	25% - 40%	1*	9 to 11*	1 + (2 to 4)*
Brushy Eradication	>40%		8 to 12	.5 + (4 to 6/ac.)
Sustainable Browse Management	Maintain 10 <40% brush canopy		1 to 3/ac.	.25 + (1 to 2)/ac.

**Recommendation is based on how many acres to carry one animal unit per year. In Iowa, this is generally 1 cow for 3-5 acres. The table below provides the number of goats or cow/goat combinations per acre.*

Example: Total acres of brush multiplied by 8-12 then divided by the number of grazing weeks between green-up and August 1st equals the initial stocking rate. This is the number of goats needed to defoliate the entire acreage in one grazing season (Generally May 1 – July 31 or about 12 weeks). Research shows that defoliation after August 1st has little effect on brush species mortality.

25 acres x 10 goats/ac. ÷ 12 weeks = 21 goats initial stocking rate. All goats are in one herd and rotate within the 5 paddocks. NOTE: It will be almost impossible to get 80% defoliation without paddocks.

Goat Grazing Preferences

Preferred species: Multiflora rose, blackberry, greenbriar, honeysuckle, locust, sumac, willow, mulberry, wild grape, autumn olive, gooseberry, chicory, red clover, ragweed, lambs quarter, sericea lespedeza, crown vetch, poison ivy/oak, spotted knapweed, pigweed, oak, walnut, agrimony, leafy spurge.

Intermediate preference: cedar, buck brush, hickory, ironweed, spiny amaranth, curly dock, pokeweed, buttercup, white clover, thistle, bur dock, ox-eye daisy, queen anne's lace, garlic mustard.

Not preferred: most grasses

Undesirable or potentially poisonous: horse nettle (poisonous), perilla mint, woolly croton, buffalo burr, wild cherry (okay if fresh, poisonous if wilted), Switchgrass (may cause photosensitivity), alsike clover (may cause liver damage)

Fence

Use IA-92 Fence construction specifications for goat boundary fencing options. Interior or paddock fences range from 2 to 3 electrified poly-wires to an electrified netting fence. Voltages between 4000 and 7000 volts are recommended for goats.